

# ISO 14001 standard: Benefits, Motivations and Difficulties throughout the Implementation Process

Cunha, A.<sup>1,2</sup>, Cabecinhas, M.<sup>3</sup>, Domingues, P.<sup>3</sup>, Teixeira, V.<sup>1,2</sup>

<sup>1</sup>)Department of Biological Engineering, University of Minho, Portugal

<sup>2</sup>)Faculty of Sciences, University of Porto, Portugal

<sup>3</sup>) Department of Production and Systems, ALGORITMI Research Centre, School of Engineering, University of Minho, Portugal

## ABSTRACT

**Purpose**– The purpose of this paper is to present a summary of the benefits, motivations and difficulties in implementing the ISO 14001 standard, which is the key reference in the field of corporate environmental management.

**Design/methodology/approach**- A literature research was carried out in order to get understanding about the key concepts of ISO 14001, to investigate the reason why companies feel motivated to adopt this EMS and to identify the associated benefits and difficulties in the implementation.

**Findings** – This paper shows the benefits found by certified companies can be classified in internal, external and relations benefits. The impact of the certification on financial and organizational performances showed to be positive. Enhancement of internal processes, strengthening of results, prevention of potential problems and a larger number of stakeholders are pointed as important performance improvements.

**Originality/value** - This paper focuses on the ISO 14001 certification motivation and importance. Thus, this paper contribution lies on providing information regarding possible benefits and difficulties that may occur due to EMS implementation.

**Keywords:** ISO 14001, Standard, Environmental management systems.

**Paper type:** Literature review.

## **INTRODUCTION**

The concern with the environment is nowadays an important issue for the general population and, consequently people become more demanding in their choices and tend to pick environmentally friendly products and services. According to this, organizations require adjustments regarding environmental policies and need to acquire practices that may lead to environmental conscious products and services. Therefore, several companies choose to adopt an Environmental Management System (EMS), namely the ISO 14001 standard which is the main reference in this field (Boiral, Guillaumie, Heras-Saizarbitoria, & Valery Tayo Tene, 2017).

Released in 1996 through the ISO 14000 series and with a structure based on the ISO 9001 standard, the ISO 14001 was developed by the International Organization for Standardization to encourage the implementation and external recognition of a certifiable EMS. This is presented as an effective tool to improve environmental practices and organizational effectiveness. Furthermore, this standard became the leading EMS worldwide and has suffered updates in 2004 and 2015.

ISO 14001 is based on the Plan, Do, Check, Act (PDCA) cycle and this methodology promotes a process of continuous improvement of the organization's effectiveness, enables organizations to evolve their environmental performance and demonstrate compliance with the existing laws and increase their relationship with stakeholders (Sorooshian, Cai Qi, & Li Fei, 2018; Sousa Lira, Gomes Salgado, & Beijo, 2018).

While the Eco-Management and Audit Scheme (EMAS) is only applicable at the site level, ISO 14001 can be applied at the facility, company, or organizational levels (Sousa Lira, Gomes Salgado, & Beijo, 2018). Companies implement this EMS since it allows them not only to improve their environmental aspects but also provides an increase in staff morale, profit growth and a better relationship with clients and investors. This due to the fact that ISO 14001 is associated with an improvement of the company's reputation and image.

## **LITERATURE REVIEW BY BIBLIOMETRIC ANALYSIS**

In Bibliometric Analysis the size of each item is proportional to the co-occurrence frequency of that keyword. In terms of frequency, the "ISO 14001" is the keyword with the largest one (64). Other high frequency keywords include: "certification" (29), "performance" (27) and "adoption" (26). In addition, "benefits" appears further in the list, with a frequency of 11, although with strong linkage with recurrent keywords, such as "ISO 14001", "performance" and "impact" (Fig 1).

As far as clusters of keywords is concerned, we identified three clusters in Fig.1 with the help of VosViewer: blue, red and green. The red cluster's keywords include "ISO 14001", "certification" and "adoption" that define the research in general regarding the adoption of the EMS and the certification process. The blue cluster reunites keywords such as "performance", "benefits", "motivations" and "environmental-management" focusing on the reasons to adopt the EMS and the benefits that may come from that implementation. The green cluster focuses on keywords such as "impact", "environmental management system" and "environmental performance" highlighting the papers that approach the environmental impacts and outcome of the ISO 14001 implementation.

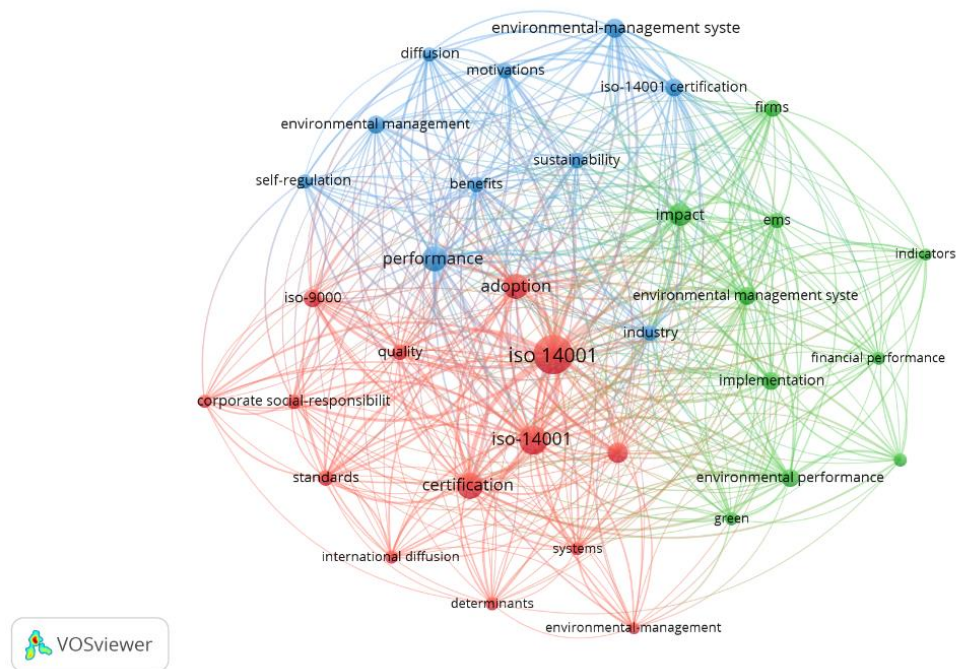


Figure 1. The keywords co-occurrence network. Source: Visualization in VOSviewer from Web of Science. 416 keywords, minimum number of occurrences of a keyword = 6, 75 items & 3 cluster & 443 links.

Besides an analysis of the frequencies of some keywords, we have created a world map where the number of articles we analyzed for this review are distributed by country. Of the thirty-two articles, six originated in Canada, four in the United States of America (USA) and three in Malaysia, and these were the countries with the most articles published in the ones we analyzed (Fig.2).

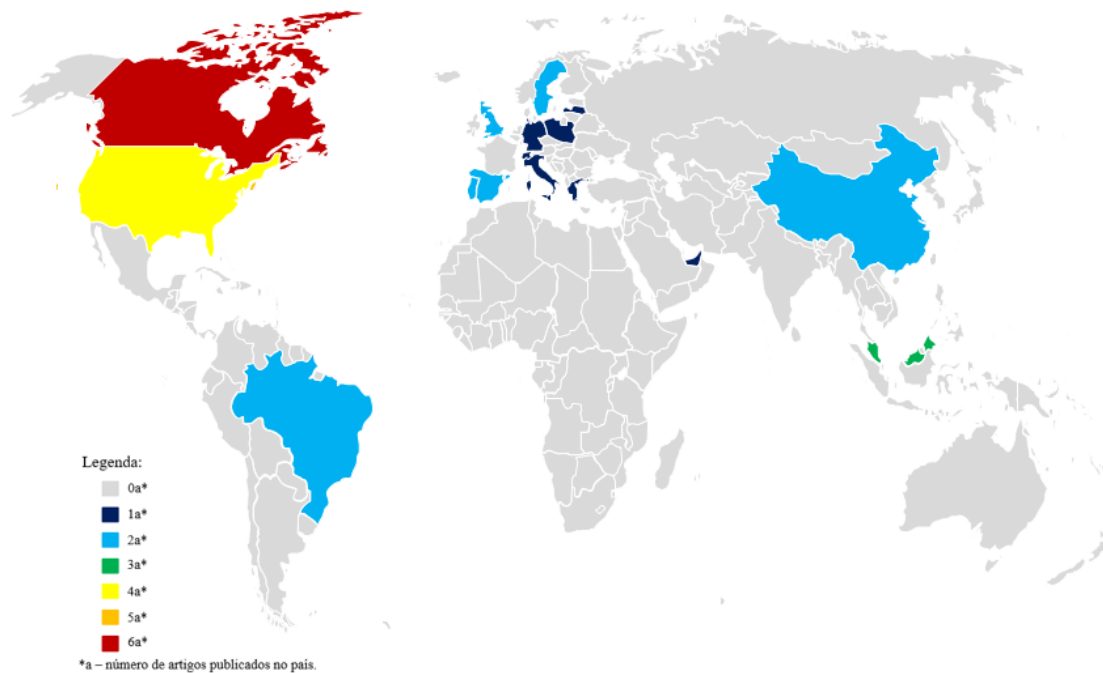


Figure 2. World map with distribution of the articles analyzed in this review.

Looking at the map (Fig. 2) with attention we notice that the European continent has the largest number of published articles (14) followed by the American (12) and lastly Asia (6). Although at first look there seem to be more publications in the American continent, the European has more countries to publish, even if each one publishes less than Canada or USA.

## RESEARCH METODOLOGY

This article consists on the research and bibliographic review of published articles regarding ISO 14001. The databases to acquire those articles were Web of Science, Researchgate and Scopus. In order to find these articles keywords such as “Implementation of ISO 14001”, “ISO 14001 benefits”, “ISO 14001 motivations” and “ISO 14001 difficulties” were used.

Due to the extended number of publications, some relevant articles were chosen to be further analyzed. Selection of publication that may possess relevant information was made according to the title and abstract presented. After analysis, we gathered a set of articles that had important information about the benefits, motivations and difficulties related to ISO 14001 implementation and some studies that presented results based on companies’ surveys.

The distinction between benefits, motivations and difficulties was not difficult since in all the articles analyzed information was very clear. Since benefits are all the advantages that the company gets with the implementation of this standard, the motivations are what leads the company to seek certification

and, at last the difficulties are characterized as being the barriers that the company faces when implementing or the reasons for some to not want to implement ISO 14001.

### ***Benefits***

The benefits of EMS can be divided into two categories:

- Internal
- External:

Internal benefits state the advantages obtained within the company, while the latter refers to the benefits of the implementation of the EMS obtained from outside the organization and these two categories are interconnected and do affect each other. For example, the improvement of processes that save raw materials lead to increased profit and, consequently, to increased competitiveness and investors interest as shown in Table 1.

#### ***Internal benefits***

The processes improvement will lead to saving of raw materials, reductions in the use of energy and water as well as waste minimization, which, consequently, causes the reduction of costs and provides an increase in the company's profit. Furthermore, usage of improved processes and technologies increases employee's safety thus improving their moral and motivation and becoming an incentive to improve the work efficiency (Sorooshian, Cai Qi, & Li Fei, 2018).

ISO 14001 provides steps and goals that allow an improved communication between employees and top management and contribute to the organization's effectiveness. Besides that, companies display improved employee training and knowledge, increasing their awareness of environment issues, criteria, and processes (Boiral, Guillaumie, Heras-Saizarbitoria, & Valery Tayo Tene, 2017).

The implementation of the ISO 14001 certification requires the application of measures and the obedience of laws that thus allow the organization to become compliant of such laws and anticipate legal risks, reduce fines and penalties (Morrow & Rondinelli, 2002).

#### ***External benefits***

As a result of the ISO 14001 certification there is an improvement of the company's reputation and image, due to the fact that the measures applied for environmental protection changes consumer's perception of the organization that is seen as environmentally friendly and is releasing less waste to the environment.

This will lead to an improvement in the relationship with shareholders, investors and clients, consequently increasing customer satisfaction (Reis, Neves, Hikichia, Salgado, & Beijo, 2018).

The fact that the EMS increases employee's safety and promotes law compliance attracts the interest of investors since it minimizes problems that may occur in comparison with companies that do not possess this certification (Sorooshian, Cai Qi, & Li Fei, 2018).

Due to the exponential growth of the population's environmental consciousness, costumers tend to prefer environmentally friendly products compared to non environmentally friendly products or the products of competitors that do not have EMS, becoming an opportunity for market expansion (Sorooshian, Cai Qi, & Li Fei, 2018).

Therefore, a company can achieve competitive advantage by increasing operational efficiency, improving its image and introducing new products and market opportunities ( Roy, Boiral, & Lagace, 2001).

Table 1- Internal and external benefits.

Benefits	Internal	Increased employee's safety	(Hillary, 2004), (Sorooshian, Cai Qi, & Li Fei, 2018)
		Enhanced staff morale	(Hillary, 2004), (Sorooshian, Cai Qi, & Li Fei, 2018)
		Waste minimization	(Hillary, 2004), Tan (2005), (Psomas, Fotopoulos, & Kafetzopoulos, 2011) (Sorooshian, Cai Qi, & Li Fei, 2018)
		Environmental awareness	(Hillary, 2004, (Sorooshian, Cai Qi, & Li Fei, 2018)
		Reduction in energy use	(Hillary, 2004), (Sorooshian, Cai Qi, & Li Fei, 2018)
		Reduction in costs	(Hillary, 2004), (Sorooshian, Cai Qi, & Li Fei, 2018)
		Saving of raw materials	(Hillary, 2004), (Sorooshian, Cai Qi, & Li Fei, 2018)
		Profit growth	(Hillary, 2004), (Tan, 2005), Sambasivan and Fei (2008)
		Compliance with existing laws	(Hillary, 2004), (Sorooshian, Cai Qi, & Li Fei, 2018)
		Improved internal communication	(Hillary, 2004), (Sorooshian, Cai Qi, & Li Fei, 2018)
	External	Market expansion	(Hillary, 2004), (Sorooshian, Cai Qi, & Li Fei, 2018)
		Improvement of the company's reputation and image	(Psomas, Fotopoulos, & Kafetzopoulos, 2011), (Hillary, 2004), (Tan, 2005), (Sambasivan & Fei, 2008)
		Enhancement of the relationship with clients, shareholders and investors	(Hillary, 2004), Tan (2005), (Sambasivan & Fei, 2008)
		Increased competitiveness	(Tan, 2005), (Hillary, 2004), (Sorooshian, Cai Qi, & Li Fei, 2018)
		Improved customer satisfaction	(Hillary, 2004), (Sorooshian, Cai Qi, & Li Fei, 2018)

## MOTIVATIONS

Due to globalization and consequent strong competition within the industry, it becomes imperative that companies stand out and differentiate from one another. In order to do so new technologies, management plans, missions and values are adopted, namely with environmental character.

The pressure applied upon organizations to become environmentally friendly grows more and more every day and the implementation of ISO 14001 becomes an asset and one of the main reasons for the EMS certification, with external motivations (Boiral & Heras-Saizarbitoria, ISO 9001 and ISO 14001: Towards a Research Agenda on Management System Standards, 2013; Heras-Saizarbitoria, Boiral, & Allur, 2018). Internally, the motivations include legal requirements that the certification entails and environmental performance, once it reduces uncertainties of the company's environmental impact. Externally, many organizations advocate good environmental practices. Despite all, the major motivation for the EMS certification is in fact economical (Liu, Yuan, Hafeez, & Li, ISO 14001 certification in developing countries: motivations from trade and environment, 2019).

According to some authors the motivations may be divided in not two, but in four categories: market drivers, social drivers, financial drivers and regulatory drivers (Sorooshian, Cai Qi, & Li Fei, 2018). In analysis, motivations can be grouped in two main groups, internal like a reduce the costs of energy (Sorooshian, Cai Qi, & Li Fei, 2018) and external, and then divided in two subgroups, regulatory and financial drives, and market and social drivers, respectively. (Table 2)

Table 2 - Motivations distributed by categories.

External	Regulatory Drivers	Public environmental disclosure requirements.	(Sorooshian, Cai Qi, & Li Fei, 2018) (Liu, Yuan, Hafeez, & Li, 2019)
		Regulatory agency inspections.	(Sousa Lira, Gomes Salgado, & Beijo, 2018)
		Green Certification.	(Sorooshian, Cai Qi, & Li Fei, 2018)
		Regulatory simplification.	(Sorooshian, Cai Qi, & Li Fei, 2018) (Psomas, Fotopoulos, & Kafetzopoulos, 2011)
	Financial Drivers	Special tax exemption for expenditure and insurance coverage.	(Sorooshian, Cai Qi, & Li Fei, 2018) (Psomas, Fotopoulos, & Kafetzopoulos, 2011) (Sousa Lira, Gomes Salgado, & Beijo, 2018)
		Social – ethical investing.	(Sousa Lira, Gomes Salgado, & Beijo, 2018)
		Environmental capital	(Sorooshian, Cai Qi, & Li Fei, 2018) (Psomas, Fotopoulos, & Kafetzopoulos, 2011)
		Increase investor confidence.	(Sousa Lira, Gomes Salgado, & Beijo, 2018) (Sorooshian, Cai Qi, & Li Fei, 2018)



		Prevent or minimize financial damages.	(Sousa Lira, Gomes Salgado, & Beijo, 2018) (Psomas, Fotopoulos, & Kafetzopoulos, 2011) (Sorooshian, Cai Qi, & Li Fei, 2018)
<u>Internal</u>	Market Drivers	Technological advantage.	(Psomas, Fotopoulos, & Kafetzopoulos, 2011) (Sorooshian, Cai Qi, & Li Fei, 2018)
		Overcoming export barriers.	(Sorooshian, Cai Qi, & Li Fei, 2018)
		Experience and differentiation advantage.	(Sorooshian, Cai Qi, & Li Fei, 2018) (Sousa Lira, Gomes Salgado, & Beijo, 2018)
		First-mover advantage in leading the market.	(Psomas, Fotopoulos, & Kafetzopoulos, 2011) (Sorooshian, Cai Qi, & Li Fei, 2018)
		Improves the organization's image.	(Psomas, Fotopoulos, & Kafetzopoulos, 2011) (Sousa Lira, Gomes Salgado, & Beijo, 2018)
		Greening of trade.	(Sorooshian, Cai Qi, & Li Fei, 2018)
	Social Drivers	Community and trading partners pressure.	(Liu, Yuan, Hafeez , & Li, 2019) (Sorooshian, Cai Qi, & Li Fei, 2018)
		Activist Campaigns.	(Liu, Yuan, Hafeez , & Li, 2019) (Sorooshian, Cai Qi, & Li Fei, 2018) (Psomas, Fotopoulos, & Kafetzopoulos, 2011)
		Media attention.	(Sorooshian, Cai Qi, & Li Fei, 2018) (Liu, Yuan, Hafeez , & Li, 2019)
		Green politicians.	(Liu, Yuan, Hafeez , & Li, 2019)

The implementation of the EMS is motivated by another major category, the environmental, which consist in the improvement of environmental effectiveness. In result can be observed the reduction of negative environmental impacts, growth of the international green consumerism and enhanced relationships with clients, investors and overall community that will lead to improvement of the corporation's image.

In conclusion, most of these motivations are linked and together lead to two major ones: improved environmental practices and economic growth.

## DIFFICULTIES

For a company is crucial to detect and comprehend its difficulties, in order to overcome them. The same principle is applied to the ISO 14001 implementation since difficulties in the detection of problems regarding environmental performance can interfere with certification. However, this may not happen if the organization is able to use its strengths and transform their weaknesses in opportunities, overcoming any difficulties that may arise. (Sorooshian, Cai Qi, & Li Fei, 2018).



Table 3- Difficulties distributed by categories.

Internal	High implementation cost.	(Sorooshian, Cai Qi, & Li Fei, 2018) (Boiral, Guillaumie, Heras-Saizarbitoria, & Valery Tayo Tene, 2017)
	High maintenance cost.	(Boiral, Guillaumie, Heras-Saizarbitoria, & Valery Tayo Tene, 2017) (Sorooshian, Cai Qi, & Li Fei, 2018)
	Lack of in-house professionals, knowledge, and skills.	(Sorooshian, Cai Qi, & Li Fei, 2018) (Boiral, Guillaumie, Heras-Saizarbitoria, & Valery Tayo Tene, 2017)
	Organization's vision and mission not align with EMS	(Sorooshian, Cai Qi, & Li Fei, 2018)
	Lack of resources.	(Sorooshian, Cai Qi, & Li Fei, 2018) (Boiral, Guillaumie, Heras-Saizarbitoria, & Valery Tayo Tene, 2017) (Psomas, Fotopoulos, & Kafetzopoulos, 2011)
	Difficulties in motivating the sense of environmental responsibility among some employees.	(Sorooshian, Cai Qi, & Li Fei, 2018)
	Lack of commitment from organization's employees.	(Sorooshian, Cai Qi, & Li Fei, 2018)
	Process of making strategic environmental decisions encompassing all organizational departments is time consuming.	(Sorooshian, Cai Qi, & Li Fei, 2018)
	Uncertainty over the benefits of certificate outcome.	(Sorooshian, Cai Qi, & Li Fei, 2018)
	Number of preparation phases for implementing environmental management system.	(Sorooshian, Cai Qi, & Li Fei, 2018)
	High volume of documentation and paperwork activities.	(Sorooshian, Cai Qi, & Li Fei, 2018) (Santos, Rebelo, Lopes, Silva, & Alves, 2015)
External	Lack of government support and incentives.	(Sorooshian, Cai Qi, & Li Fei, 2018)
	Lack of environmental laws and regulations.	(Sorooshian, Cai Qi, & Li Fei, 2018)
	Long registration process.	(Sorooshian, Cai Qi, & Li Fei, 2018)
	Outdated legislation.	(Sorooshian, Cai Qi, & Li Fei, 2018)

According to Sorooshian, Cai Qi, & Li Fei (2018) and like in other topics previously discussed, the difficulties and barriers that an organization may encounter due to ISO 14001 certification can be divided into two groups, internal and external (Table 3). Several authors address high costs and highly time consuming as the main barriers, as well as the most transversal.

Since two of the motivations to acquire this certification are to improve the company's image and to present a competitive advantage over other organizations, the difficulties of small companies to support the involved costs may lead bigger ones to take advantage of the opportunity. They may adopt

the EMS in a superficial way and not alter significantly their environmental practices, as suggested by numerous studies (Boiral, Guillaumie, Heras-Saizarbitoria, & Valery Tayo Tene, 2017).

According to Santos, Rebelo, Lopes, Silva, & Alves (2015), in Portugal the lack of investment support is the main reason mentioned by companies to non-certification, followed by companies viewing the EMS only as a marketing tool. The high implementation costs of the EMS are seen by many companies as not worth it since many consider that low environmental risks don't justify the expense. This leads to believe that many small and medium-sized enterprises (SMEs) are not aware of the current environmental problems. Nevertheless, some of this companies adopt certain behaviors taking into account a rudimentary EMS.

These difficulties are perceived in different ways by different companies, and the same struggle may be easier or not to overcome depending on the means, capability and approach of each company (Tambovceva & Geipele, 2011). Thus, the difficulties faced due to the EMS adoption and ISO 14001 certification are also imperative factors for the company's decision to adopt the EMS standard. It is important to keep in mind that internal difficulties can be controlled by the company, while the external ones cannot.

## CONCLUSIONS

ISO 14001 is a certification that ensures that a company has an environmental management system with a developed structure, allowing control of the significant environmental impacts and continuous improvement of procedures and business strategies.

Due to the current trends and populations' awareness of the environmental problems that humanity faces, there is an exponential growth of adoption of environmental measures taken by organizations in order to gain customer satisfaction and investors trust. Benefits of EMS implementation also include increased employee's safety, profitability and competitiveness.

Nevertheless, high implementation costs financial, staff training and time-consuming paperwork that may deviate employees from essential tasks. Small and medium-sized firms face internal and external barriers when seeking to address their environmental issues and adopt EMSs. Initially, internal barriers have the more significant role in impeding progress giving the fact that many SME are skeptical of the benefits obtained through environmental improvements (Hillary, 2004).

Taken into consideration all the information regarding the EMS, ISO 14001 may be seen as a step towards a more environmentally friendly organization and as a tool to promote and implement consciousness, not only in employees but also in the general public.

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